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Inertial sensor for TianQin project

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TianQin is a Chinese space-borne gravitational wave detector proposed in 2014, and aims to detect gravitational waves in the frequency range of $1\text{mHz} \sim 1\text{ Hz}$, with three earth orbiting satellites with an orbital radius of about 105 km forming an equilateral triangle with side length $1.7 \times 10^5\text{ km}$. The free falling test masses are used as inertial references to provide measurement points for intersatellite laser interferometry, and also to guide the micro-thrusters control the spacecrafts to follow up them. The residual acceleration noise in the direction of the sensitive axis (intersatellite link) must be not exceed $10\text{-}15\text{ m/s}^2/\text{Hz}^{1/2}$ within the detection band for TianQin. In this talk, firstly I will introduce the TianQin mission, and then present the requirement analysis and preliminary design of inertial sensor, finally give current progresses and its verification on the ground and in flight.

Presenter: ZHOU, Ze-Bing

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